

(No Model.)

2 Sheets—Sheet 1.

C. B. STERLING.  
ELECTRIC BELL.

No. 539,966.

Patented May 28, 1895.

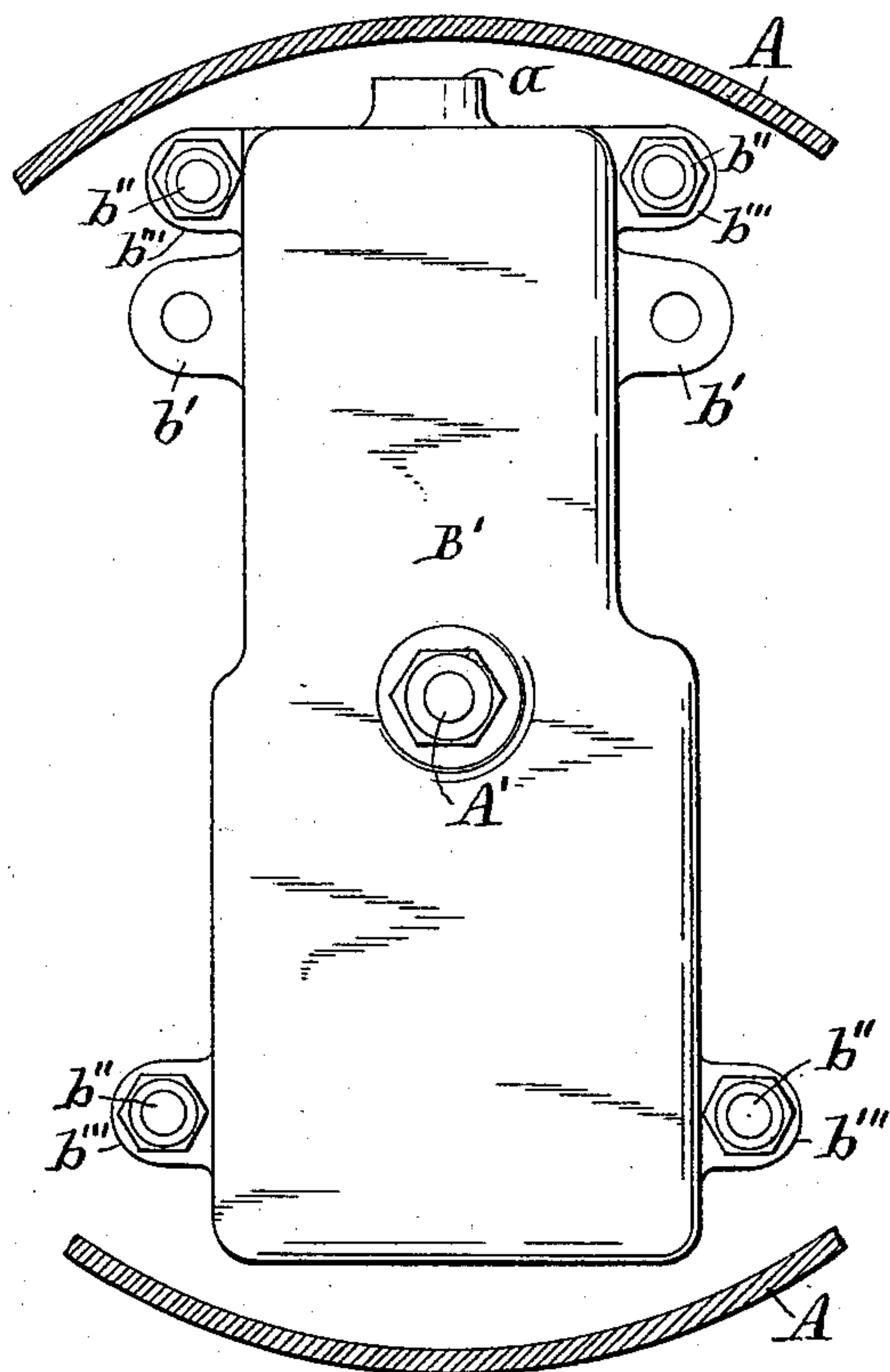


Fig. 1.

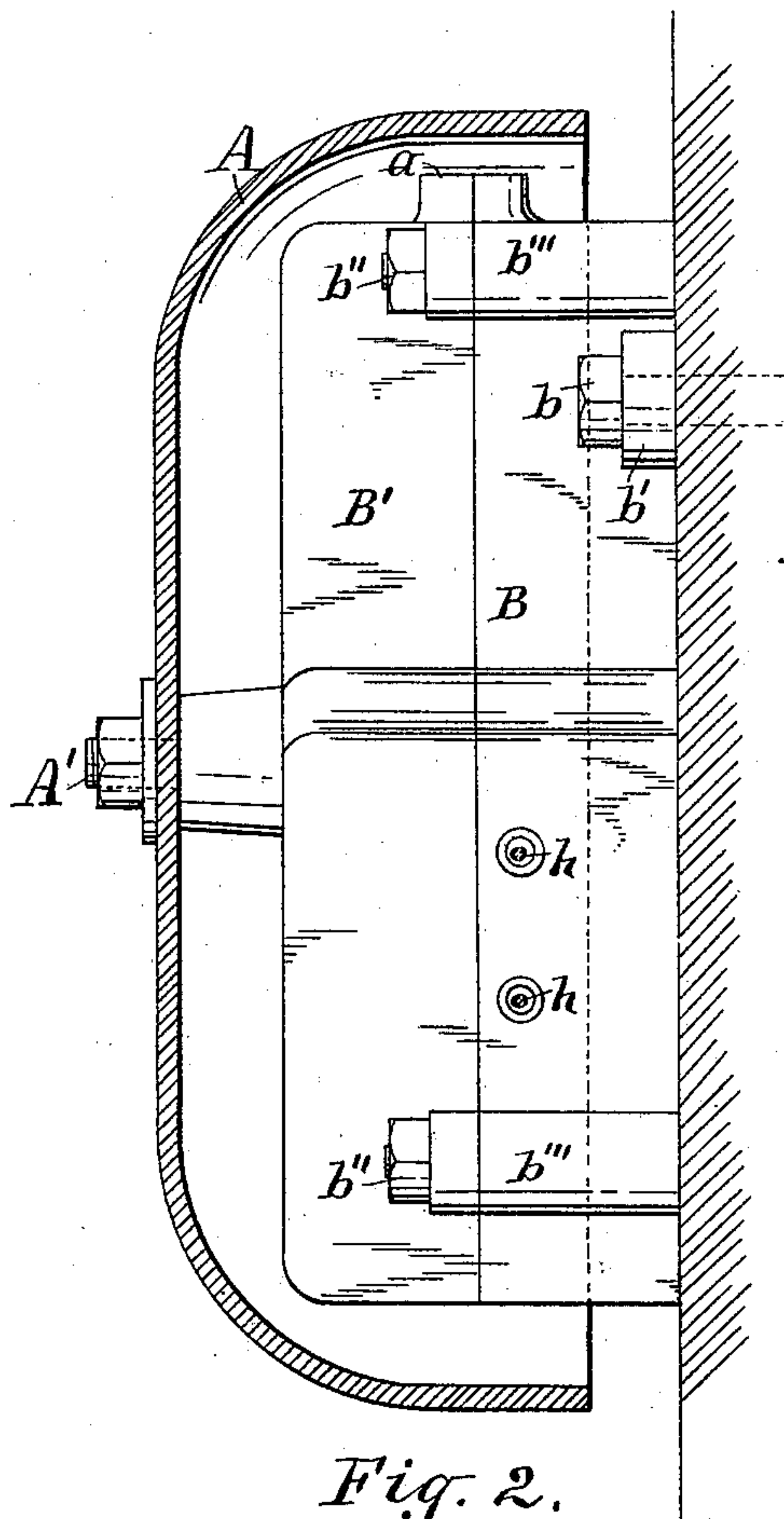


Fig. 2.

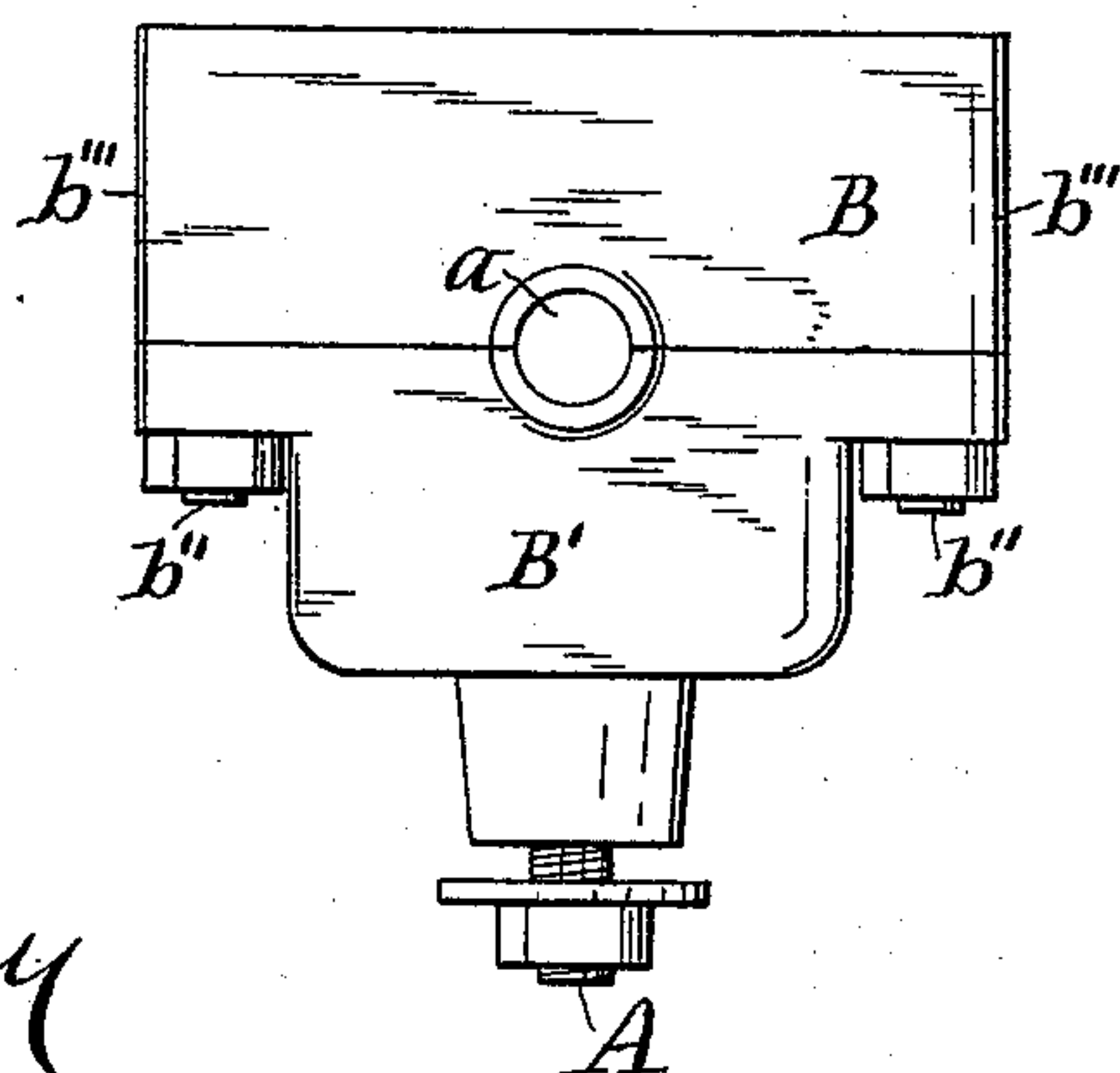


Fig. 3.

Witnesses:

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R. S. Dewey.

Inventor.

Charles B. Sterling  
By C. H. Duell  
his Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

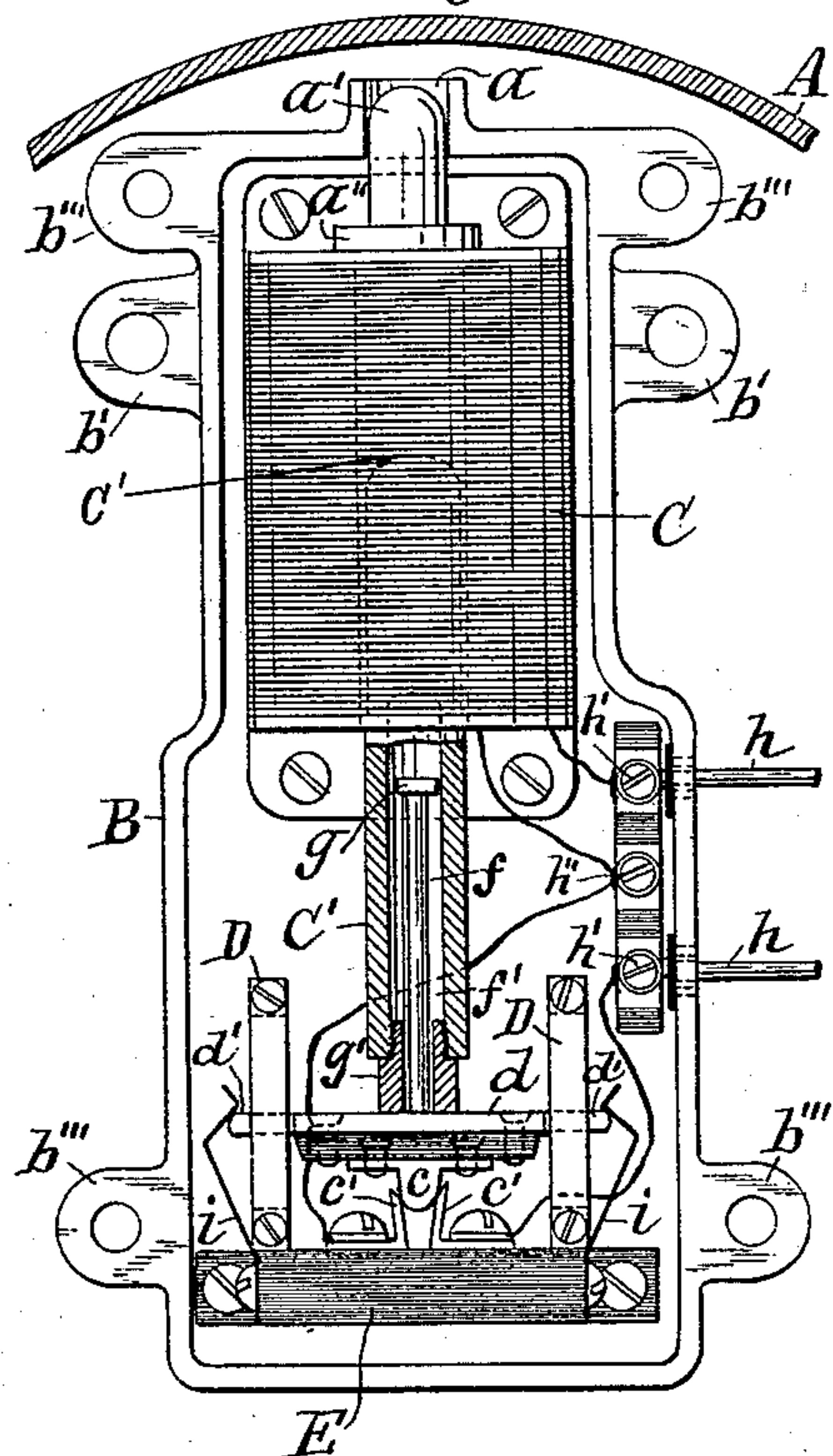
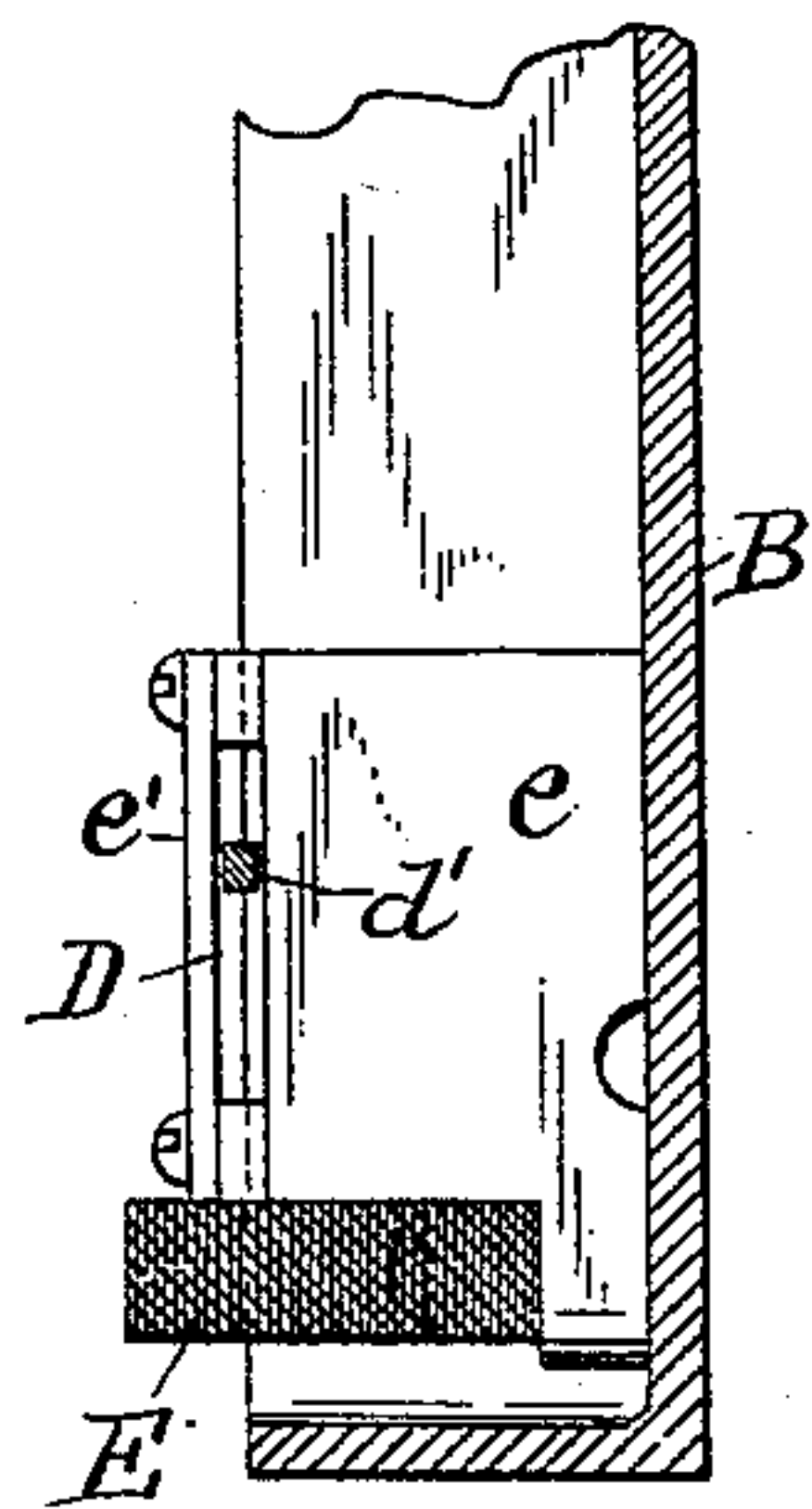
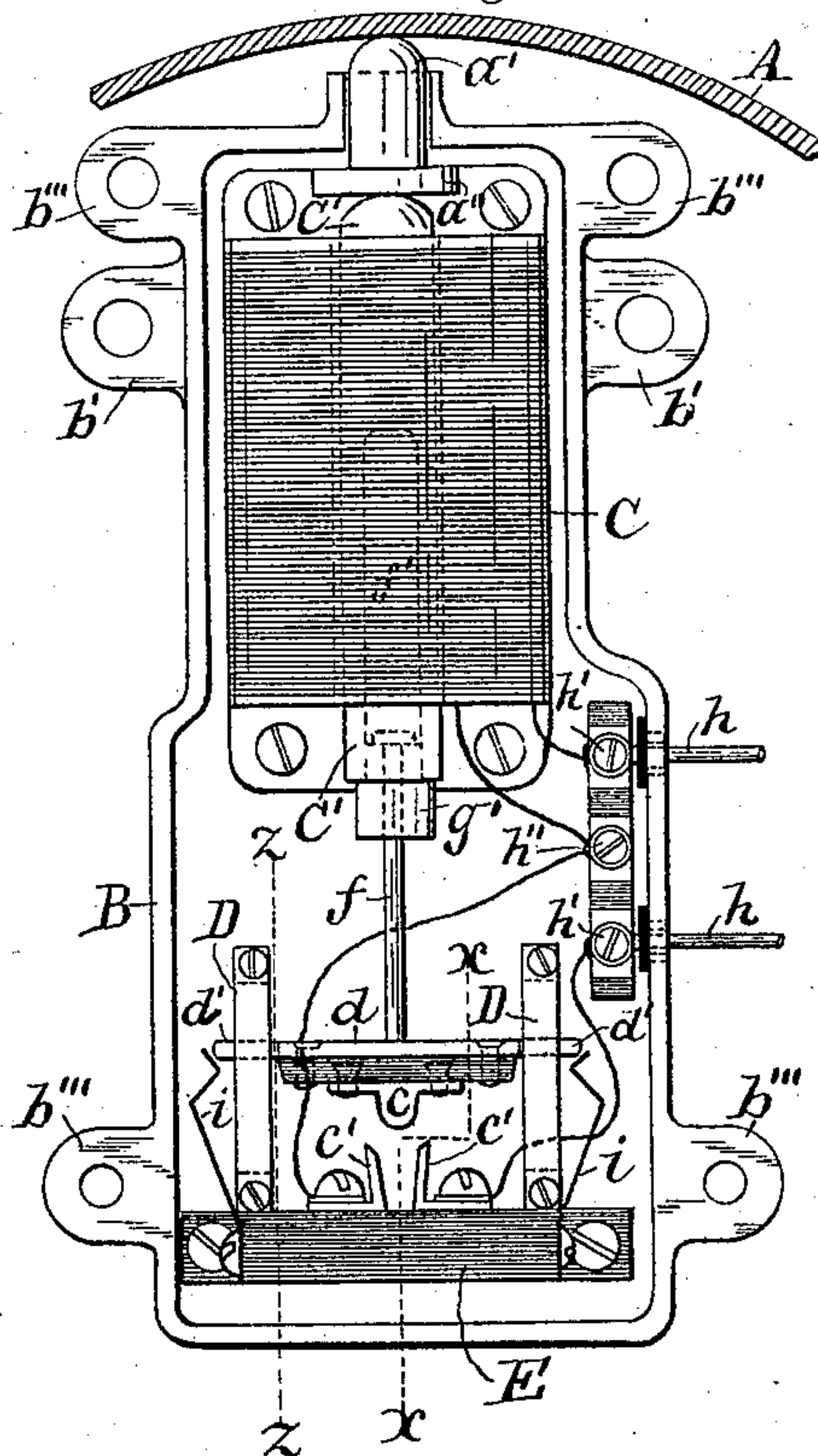
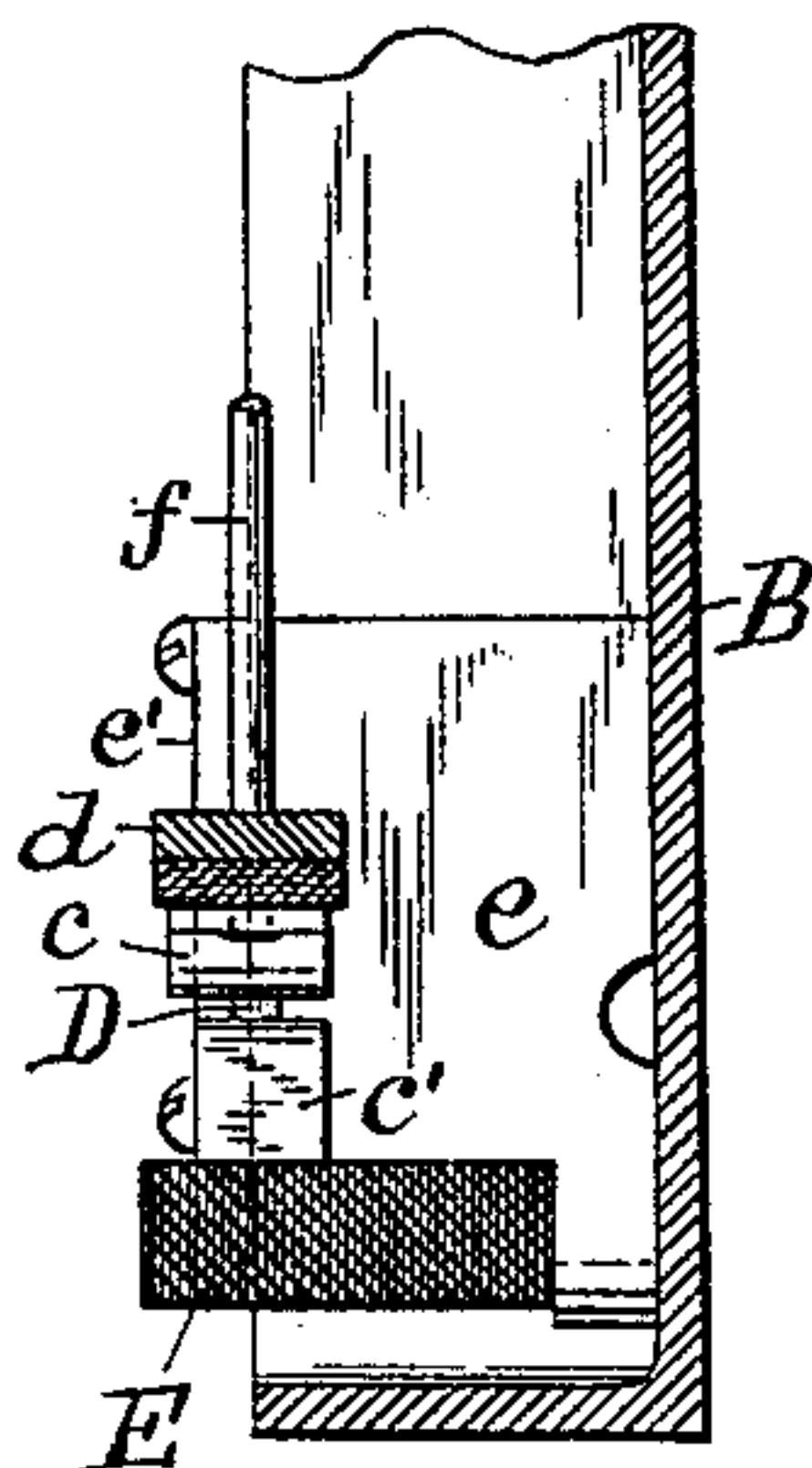


Fig. 5.



*Fig. 6.*



*Fig. 7.*

Witnesses:

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# UNITED STATES PATENT OFFICE.

CHARLES B. STERLING, OF NEW YORK, N. Y., ASSIGNOR TO THE DEWEY  
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## ELECTRIC BELL.

SPECIFICATION forming part of Letters Patent No. 539,966, dated May 28, 1895.

Application filed March 14, 1895. Serial No. 541,662. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES B. STERLING, of New York, in the county of New York, in the State of New York, have invented new and useful Improvements in Electric Bells, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to electric bells or gongs for signaling and other purposes, and particularly for use on electric street cars, and the object of my invention is to provide a device of this nature that will be simple, and durable and that will be thoroughly protected from water and dirt, to which it is often exposed.

To this end my invention consists in the combination with a coil or solenoid and the bell hammer, of a core for the solenoid, a circuit maker and breaker loosely connected to said core and movable vertically, stationary contacts insulated from each other to engage the circuit maker, guides for the circuit maker and breaker, and springs to support the circuit maker above the contacts to keep the circuit open until the core falls and forces the circuit maker into contact with the stationary contacts; and my invention consists in certain other combinations of parts hereinafter described and specifically set forth in the claims.

In the drawings hereto annexed, Figure 1 is the front side elevation of the case inclosing the working parts of the bell with portions of the gong shown in section. Fig. 2 is an elevation of the same looking from right to left. Fig. 3 is a top plan view of same, the gong being entirely removed. Fig. 4 is a view similar to Fig. 1 with the front of the case removed to show the working parts in their normal position. Fig. 5 is a view showing the parts in their raised or operative position; and Figs. 6 and 7 are sectional views taken, respectively, on lines  $x x$  and  $z z$  of Fig. 5.

Referring specifically to the drawings, A indicates the bell or gong and B, B' show the case. The case is divided in two parts the junction of said parts extending vertically, on a plane parallel with the front of the case, and midway between the front and back sides thereof. The back part, B, of the case is secured to a

support by means of bolts,  $b$ , passing through ears,  $b'$ , extending from the sides of the part, and the front part, B', is secured to the back part, B, by four bolts,  $b''$ , passing through ears,  $b'''$ , at or near each corner of the case. A bolt, A', projects horizontally outward from the center of the front side of the case to hold and secure the gong A, as shown in Figs. 1 and 2 of the drawings. By means of this case the working parts are thoroughly protected from dirt and water. The only opening is in the top of the case between the two parts thereof and this opening,  $a$ , is for the purpose of allowing the bell hammer,  $a'$ , to work or move vertically therethrough to strike the gong. This opening,  $a$ , is covered by the said gong, which is but a short distance therefrom. The hammer,  $a'$ , is a short round spindle somewhat smaller in diameter than the opening,  $a$ , and with a flange,  $a''$ , on its lower end which rests upon and covers the vertical bore in the solenoid, C, secured stationary in the upper part of the case. As will be seen in the drawings, all the inner parts are mounted within and upon the part, B, the part, B', being the cover therefor.

Below the solenoid, C, is a vertically movable circuit maker and breaker. This circuit maker and breaker consists of a wedge shaped piece,  $c$ , secured to but insulated from a horizontal plate,  $d$ , above it, by a strip of fiber secured between the two parts,  $c$ , and  $d$ . The ends of the plate,  $c$ , are provided with narrow extensions,  $d'$ ,  $d'$ , which are adapted to work in slots or guides D, D. The guides are formed by two narrow, parallel projections,  $e$ ,  $e$ , extending from the inner side of the back of the case, and strips,  $e'$ ,  $e'$ , mounted thereon but separated therefrom at each end to form the slots in which the extensions,  $d'$ ,  $d'$  work.

From the center and upper side of the plate,  $d$ , extends vertically a spindle  $f$ . This spindle enters a bore,  $f'$ , in the lower end of the core, C', of the solenoid C. The upper end of the spindle is upset or is provided with a head,  $g$ , to engage the plug,  $g'$ , screwed into the lower end of the core after the spindle,  $f$ , is inserted, just before the core reaches its highest point, to break the circuit through said coil and allow said core to descend.



Below the circuit breaker, upon each side of the wedge or contact, *c*, is a contact, *c'*, mounted upon a block, *E*, of insulating material as fiber, and between which contacts the wedge, *c*, lies when in its lowest position to close the circuit through the coil or solenoid *C*.

The contacts, *c'*, *c'*, are angular-shaped and somewhat flexible so that good contact will be made between them by the wedge *c*.

*h*, *h* are the supply or leading in wires which are connected to screws, *h'*, *h'*, mounted on a block of insulating material within and on the right hand side of the case. From the uppermost screw the circuit leads to and through the coil, *C*, thence to one of the contacts *c'*, and from the other contact, *c'*, to the lowest screw *h'*. For the sake of convenience in connecting the coil with the contact, *c'*, a third binding screw, *h''*, between the others, unites the connections from the said parts as shown in Fig. 5. Angular springs, *i*, *i*, formed of sheet metal are secured to the ends of the block, *E*, and bear with their free ends against the ends of the extensions, *d'*, *d'*, in such a manner that when the circuit breaker is drawn upward by the core, to break the circuit, and above the springs, *i*, *i*, the breaker will be prevented from falling and again making the circuit until the weight of the core forces the circuit breaker below the ends of the said springs or the angles therein.

The operation is as follows: When the supply circuit is closed by a key or push-button, not shown in the drawings, the electric current flows from the source to the upper one of the binding screws, *h'*, thence through the coil, *C*, to the left hand contact, *c'*, thence through the wedge, *c*, of the circuit maker and breaker to the opposite contact, *c'*, and from the latter contact to the lower binding screw, *h'*, and supply conductor, *h*, thus completing the circuit. The flow of the current through this path causes the coil, *C*, to be energized and the core, *C'*, to be raised or drawn upward within the solenoid, to force the hammer, *a'*, upward against the gong, *A*, thus sounding the bell. Just before the core reaches its highest point the plug, *g'*, strikes the head, *g*, of the spindle, *f*, causing the circuit maker with its wedge, *c*, to be lifted above and separated from the contacts, *c'*, *c'*, and also above the angles or free ends of the springs, *i*, *i*. The said circuit breaker is prevented from falling and completing the circuit between the contacts, *c'*, *c'*, before the core drops to its lowest position by the said springs passing beneath the extensions, *d'*, *d'*, and holding it in its raised position. When, however, the core falls to its lowest position, it strikes the plate, *d*, with such force as to separate the springs and force the wedge between the contacts *c'*, *c'*, to complete the circuit, when the above operation is repeated. If the wedge were not prevented from falling and completing the circuit before the core fell to its lowest position, the core, *C'*, would move

but slightly and the stroke on the bell or gong would be very light and indistinct.

I do not desire to be limited to the precise construction shown as it will be obvious that it may be varied without departing from my invention. For instance the hammer, *a''*, may be dispensed with, if the core is made longer so that it can strike the bell.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the bell and the solenoid, of a vertically movable core in the solenoid, a circuit maker and breaker loosely connected to the lower end of said core and also movable vertically, a stationary contact to engage the circuit maker and breaker, a guide for the circuit maker and breaker to slide in, and electrical connections between the supply conductors and the contacts, as set forth.

2. The combination with the bell, bell hammer, and solenoid, of a core for the solenoid, a circuit maker and breaker loosely connected to said core and movable vertically, stationary contacts insulated from each other to engage the said circuit maker, guides for the circuit maker and breaker, and springs to support the circuit maker and breaker in its raised position, as and for the purpose described.

3. The combination with the bell, bell hammer, and solenoid, of a hollow core for the solenoid, a circuit maker and breaker having a spindle extending within the core, means by which the spindle is engaged by the core, guides for the circuit maker and breaker, springs to support the said maker and breaker, and stationary contacts insulated from each other, as and for the purpose described.

4. The combination with the bell, bell hammer and solenoid, of a hollow core separate from the bell hammer, a circuit maker and breaker having a spindle extending within the core, means by which the spindle is engaged by the core, guides for the circuit maker and breaker, springs to support the said maker and breaker, and stationary contacts insulated from each other, as and for the purpose described.

5. The combination with the bell, bell hammer, and solenoid of a hollow core within the solenoid, a circuit maker and breaker having a spindle extending within the core, a head on the upper end of the spindle, a stop at the lower end of the core to engage the head, guides for the circuit maker and breaker, springs to support the said maker and breaker when in its raised position, and stationary contacts insulated from each other to engage the said maker and breaker, as set forth.

6. The combination with the bell, bell hammer, and solenoid, of a hollow core within the solenoid, a circuit maker and breaker having a spindle extending within the core, a head on the upper end of the spindle, a stop at the



lower end of the core to engage the head, vertical guides for the circuit maker and breaker to work in, an insulated contact piece mounted on the lower side of the circuit maker and breaker, stationary contact pieces separated and insulated from each other for engagement with the first mentioned movable contact piece, and springs as and for the purpose set forth.

7. The combination with the bell, bell hammer, and solenoid, of a hollow core for the solenoid, a circuit maker and breaker, a spindle extending vertically and movable longitudinally within said core, a head on the upper end of said spindle, a stop in the lower end of

said core to engage the head, extensions on the circuit maker and breaker, guides for the extensions to slide in, angular springs to support the said maker and breaker when in its raised position, flexible stationary contacts insulated from each other to engage the said maker and breaker and the electric connections, substantially as described and shown.

In testimony whereof I have hereunto signed my name.

CHAS. B. STERLING. [L. S.]

Witnesses:

C. W. PERKINS,  
GEO. B. HOLLISTER.